

**A METHOD AND SYSTEM FOR AUDIENCE PARTICIPATION AND  
SELECTIVE VIEWING OF VARIOUS ASPECTS OF A THEATRICAL  
PERFORMANCE, WHETHER OPERA, SYMPHONIC, DRAMA OR  
DANCE OR COMBINATIONS AND VARIATIONS THEREOF**

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5                    CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 60/163,893 filed November 5, 1999, which is incorporated fully herein by reference.

TECHNICAL FIELD

10                  This invention relates to the field of communications systems. More particularly, the present invention relates to a method and system for controllably viewing video images of a performance and/or text related thereto.

BACKGROUND ART

15                  It has been observed by symphony and opera conductors, directors and general managers, that audiences are shrinking for classical music and opera partly because younger people are not joining the audiences in as large numbers as they previously did. College professors teaching very large classes have similarly worried about helping younger students to be more attentive in such  
20                  large venues.

                    Various methods have been implemented in the past to improve attendance at such functions. In opera houses, supertitles are generally now used, wherein the language of the opera (such as German for example) is translated into the language of the audience; that is, into English in the US or the United Kingdom;  
25                  into French in France; into Spanish in Spain; etc. This has improved the experience for those not fluent in the language of the performance. Similarly, Opera houses and Symphony Orchestras have invited the public to selected rehearsals and to pre-performance background discussions of the works to be performed, or of the authors of the works, or discussions of the mechanical  
30                  aspects of the production itself.

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**THE UNIVERSITY OF CHICAGO**

### SUMMARY OF THE INVENTION

The present invention provides a solution to the needs described above through a system and method for collecting video images and text at a performance, transmitting these data to authorized individual viewing devices in an attendees possession at the performance venue, the attendee being able to select the video image desired or text or a combination of both for viewing at the attendees location.

A system is disclosed for permitting attendees at a public performance to selectively view video, text or a combination of both by use of a viewing device. The system contains one or more video cameras for inputting video images of performers such as musicians, conductors, singers, dancers and lecturers/speakers; contains one or more input devices for inputting text data into the system; contains a central control device for receiving the video and text data, for storing these data and for transmitting these data via a short range transmission system, whereby one or more attendees through the use of individual viewing devices can selectively view a video image of a performer, related text of a combination of both at the attendees seat

Also disclosed is an apparatus for viewing video, text or a combination of both by an attendee at a symphony, opera, classroom lecture or other public performance, the apparatus having a display, memory, processing unit, control panel, and a control program in the processing unit memory adaptable to receive short range wireless transmissions of video data, text data or both, and to display selective images as chosen by the attendee.

A method is disclosed for enhancing the enjoyment of attendees at a public performance which includes: obtaining an attendee viewing device; turning on the viewing device to have it registered with a viewing system located in the venue of the performance; and selecting on the viewing device a video image of a performer or text or a combination of both, the video images and text being transmitted in a wireless mode by the viewing system and received by the attendee viewing device.

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### BRIEF DESCRIPTION OF THE DRAWINGS

The features and advantages of the system and method of the present invention will be apparent from the following description in which:

**Figure 1** illustrates an exemplary symphony stage configuration.

5       **Figure 2** illustrates a representative system containing elements of a preferred embodiment of the invention.

**Figure 3** illustrates an exemplary attendee viewing device.

**Figure 4** illustrates a block diagram of the preferred embodiment of the process of using the attendee viewing device in the preferred embodiment.

10       **Figure 5** illustrates a block diagram of the operation of the system in the preferred embodiment.

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## DETAILED DESCRIPTION OF THE INVENTION

The present invention provides a solution to the problem of providing a cost effective means of enhancing the pleasure of an attendee at a musical or dramatic or other type of public performance, through a system and method for collecting video images and text at a performance, transmitting these data to authorized individual viewing devices in an attendee's possession at the performance venue, the attendee being able to select the video image desired or text or a combination of both for viewing at the attendee's location.

## OPERATING ENVIRONMENT

The environment in which the present invention is used is now described with reference to Figure 1

In **Figure 1**, a typical performance stage is shown depicting for example, an orchestral stage setting. Similar settings in other performances would include an opera production wherein the performers on the stage are singers and dramatists, while the musicians are located in the orchestra pit (not shown); or a drama wherein the performers onstage are actors and no musicians are involved; or the performance could be a ballet or other dance performance wherein the performers on stage would be dancers and again the musicians would be in the pit; and finally the performer could be a lecturer or speaker in a classroom setting or on a similar performance stage. In each of these performance settings the basic aspects and concepts of the invention are the same.

In **Figure 1**, a stage **101** is shown containing various performers; a conductor **103**, a first violin **105**, a cellist **111**, a bass **109** and a brass (trombone) player **107**. One or more inexpensive video cameras are either mounted in a fixed position as shown **113**, **115** or could be hand held devices. These cameras would generally focus on the conductor **103** or on one of the principal players **105**, **111**, etc. These performers could be singers in an opera, dancers, etc. In this type of setting the video images would generally be carried or transmitted to a control



video receiver/processor/controller for retransmission to selected receivers and/or to video recorders. The retransmission would generally be by wireless means.

### THE INVENTION

5 In the preferred embodiment of the invention each attendee in an auditorium could be provided with an inexpensive wireless viewing device which could be used unobtrusively without interfering with the person sitting in an adjacent seat. Without the expense of wiring each seat, the viewer would have a touchpad with a few buttons that allow him/her to choose to view the musical  
10 score as the piece is played, or see opera supertitles in one of several languages, or a close-up view of the French horn section whenever it has the solo part, or the trumpets, or the cellos etc. The viewer could also choose to watch the conductor's sweating face. This strategy is one commonly used during TV shows of symphony music. Television cameramen trained to focus the telephoto lens on  
15 the currently important part of the orchestra are very skillful at this. Thus the audience can have a sense of sitting in the midst of the orchestra or opera stage, of following the score and/or libretto, and of seeing in detail what is happening 'where the action is'.

Referring now to **Figure 2**, an exemplary system describing a preferred  
20 embodiment is described. In the system, a number of video cameras **201, 203, 204** are shown connected to a server device **207** which itself is connected to or a part of a system control device **209**. Also connected to the system control device **209** could be another server **211** (which itself may or may not be a part of server **207**) to which are connected one or more text input terminals or scanners **213, 215**. The text input terminals or scanners would be used for inputting musical  
25 scores, opera text in various languages, diagrams, etc. Also connected to the system control device **209** would be another server **221** which would receive "log-on" messages from attendee viewing devices **225, 227, 229, 231, 233** As will be explained in more detail below, the attendee viewing device would transmit a  
30 "log-on" message whenever the attendee turned the device on. The log-on message to the server **221** provides the information for the particular device such

as id number, information on how another part of the system can talk to the attendee device (perhaps device driver information), which frequencies it operates with, etc., basic characteristics of the viewing device. The server 221 provides the information required to communicate with the viewing devices to the system control unit 209 so that after log-on by a viewing device, the system control 209 can transmit video and text directly 217, 235, 237 to a viewing device 225. It is contemplated that the system control device 209 would transmit all video and text data in a broadcast mode 217, 235 using different frequencies for each video camera and text channel, and an individual attendee viewing device 225 would receive 237 only the video or text data on the channel/frequency he selects by use of the selector buttons on the viewing device.

In an alternative embodiment, a simpler system would consist of a TV transmitter broadcasting all channels simultaneously, the channel selection to be done by the viewer as in a conventional TV receiver. More complex server technology is needed if it is desired to keep track of how attendees are using the system.

In a preferred embodiment of the invention it is expected that the attendee viewing devices would be devices having a Sun Microsystems Inc.<sup>TM</sup> Java<sup>TM</sup> operating system and a JINI<sup>TM</sup> capable system therein, with the server 221 being a JINI server. The entire system could be a Java/JINI based system with the video cameras 201, 203, 204 and the text input devices 213 215 and their related servers 207, 211 also being JINI compatible devices. Java and JINI are program systems provided by Sun Microsystems, Inc. and are well known to those skilled in these arts. JINI is described in more detail in the document titled "Jini(TM) Device Architecture Specification" which can be found at the Sun Microsystems web site [www.sun.com/jini/whitepapers/](http://www.sun.com/jini/whitepapers/) and which is incorporated fully herein by reference.

Alternative embodiments can include other plug-and-participate devices such as those provided by other network technologies complimentary to JINI, such as Bluetooth<sup>TM</sup>, JetSend<sup>TM</sup> and HAVI<sup>TM</sup>.

Bluetooth is a technology specification for low-cost, short range radio links among PDAs, laptops, mobile phones, and other portable devices. When two Bluetooth devices come close to each other, they automatically detect each other and establish a network connection. This is a network transport protocol that could be used to allow attendee viewing devices to be connected to a JINI compatible system without being physically connected. Bluetooth is being developed by IBM Corporation™, Intel Corporation™, Nokia Corporation™, Telephon AB™, L. M. Ericsson™ and Toshiba Corporation™.

Other technologies like Motorola's™ Piano, which can be built on top of Bluetooth, specifies what sort of information they exchange and how they communicate. It and other operating systems, like Symbian Ltd.s™ Epoc32 for cell phones, can support JINI technology.

Hewlett Packard's™ JetSend technology is another example of a service protocol that allows devices to intelligently negotiate information exchange. Similarly HAVI (Home Audio-Video interoperability) is a specification for home networks of consumer electronic devices such as CD players, televisions, VCRs, digital cameras etc. HAVI is an example of where a bridge protocol would be needed to share information between HAVI compatible devices and a JINI compatible system. HAVI is being developed by Grundig A. G.™, Hitachi Ltd.™, Matsushita Electric Industrial Co. Ltd.™, Phillips Electronics N.V.™, Sharp Corporation™, Sony Corporation™, Thompson Multimedia S. A.™, and Toshiba Corporation™.

Still another embodiment can make use of newly announced "Zipper-VDSL" technology from STMicroelectronics™ and Swedish Telecom operator Telia™, which is based on a new generation of silicon chips that are inexpensive to produce and capable of delivering full-motion video over ordinary phone lines at speeds 10 times faster than ADSL (asynchronous digital subscriber line) technology.

An exemplary attendee viewing device 300 is illustrated in Figure 3 As indicated above, in the preferred embodiment the attendee viewing device would be a Java/JINI compatible device with a processor, memory, battery for power

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device (209 in Fig. 2) which sends a "welcome" message to the viewing device so that the attendee knows he is in the system.405 The user selects a video image/camera or text option 407 by depressing the appropriate button. When the attendee is finished using the viewing device he depresses the Off button to  
5 terminate the connection.

In Figure 5 a flow chart is shown which indicates the operation of the system during the course of a performance/lecture.500 When a viewing device (or any other JINI compatible device or other plug-and-participate type device such as a camera, scanner, etc.) plugs into the system, the JINI server receives the  
10 log-on, device ID data and device access driver/protocol data 501 which it records and makes available to other system users (i.e. the system control unit) 503. The system control unit sets up mechanisms to receive data from the video cameras, for example) and to broadcast these data over a wireless output system 505, 507. The attendee viewing devices can then tune to receive the video image or text data  
15 using their selection buttons.509.

In an alternative embodiment, the viewer can have a mechanism for the attendee to provide a response or question to the performer/lecturer if requested to do so by them. These features are not available from a video tape and would be a reason for the attendee to want to come to a live performance enhanced by the  
20 availability of the present invention.

Having described the invention in terms of a preferred embodiment, it will be recognized by those skilled in the art that various types of general purpose computer hardware may be substituted for the configuration described above to achieve an equivalent result. Similarly, it will be appreciated that arithmetic logic  
25 circuits are configured to perform each required means in the claims for performing the various features of video image processing, text processing, wireless receipt and transmission to short range viewing devices. It will be apparent to those skilled in the art that modifications and variations of the preferred embodiment are possible, such as different types or makes or  
30 configurations of viewing devices, different makes and types of video cameras and text input devices, different wireless communications systems, all of which

fall within the true spirit and scope of the invention as measured by the following claims.

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